



Strategic adaptations to environments inside China

An empirical investigation in the construction industry

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Abstract

Purpose – The purpose of this paper is to examine a series of environmental factors and industrial conditions governing the construction industry in China. The outcome of this part of the analysis sheds light on the development of appropriate competitive strategies and important resources and competencies (IRCs) to establish long-term competitive advantages.

Design/methodology/approach – The overarching conceptual framework consists of both external and internal analyses. Since, the scope of work is very broad, the materials presented in this paper is limited to external analysis of environmental factors. The study is primarily derived from a literature review and synthesis of data gathered from various public sources. Certain parts of the analysis utilize frameworks developed by other researchers and selective statistical methods.

Findings – Some environmental factors, such as government intervention and legal and regulatory systems require the development of *Guanxi* (relationships) to cope with. Other factors including market structure, project procurement systems, horizontal market segments related to construction, regional characteristics and upstream and downstream functions within the construction value chain are suggestive of five potential types of competitive strategies: cost leadership, differentiation, market/product diversification, geographical diversification, and vertical/functional integration.

Research limitations/implications – The research study as a whole is targeted at large construction firms in China that belong to the First class qualification category. Therefore, the proposed competitive strategies and IRCs may not be applicable to small and medium construction enterprises.

Originality/value – Application of strategic management theories and empirical findings related to the Chinese construction industry is lacking. This research fills this gap and builds a foundation for future studies related to this industry.

Keywords China, Construction industry, Competitive advantage, Competitive strategy

Paper type Research paper



Introduction

Since, China introduced market reform in the early 1980s, the country has sustained a high growth rate, with recent trends drawing calls on provinces to cool growth-obsession (*China Post*, 2006). In the first six months of 2006, the country's economy expanded by 10.9 percent year-on-year, primarily boosted by massive foreign investments. With a constant need for infrastructure systems and urban housing to facilitate the expansion of most industries, construction has been functioning as one of the main pillars during this economic boom.

Despite the rapid growth of the Chinese construction industry, many local construction companies are still facing serious difficulties. As a result, many of these

firms are plagued by a low level of profitability. For example, using data published in the *Chinese Statistical Yearbook* (National Bureau of Statistics of China, 2004), the average pre-tax profit margin of Chinese construction firms during 1997-2002 was only about 4.6 percent, while the average after-tax net profit margin was only about 1.5 percent. Not surprisingly, the source of problems leading to such dire performance of most Chinese construction firms is diverse and can be traced to both external and internal factors.

From the external perspective, the construction industry is believed to experience "excessive competition." In China, the number of construction firms is so high that the market is even more fragmented than the situation in other countries. None of the firms capture substantial market share or is able to exert significant influence even in their local markets (Shanghai Jinxin Security Research Institute, 2002). From a corporate standpoint and the internal perspective, it is reported that many Chinese construction companies have the following problems: low quality projects in their portfolios, low level of technology, lack of financing capability, and most importantly, lack of long-term strategy and directions (Yao *et al.*, 2001).

The above factors suggest that as Chinese construction firms adjust to constant changes due to economic reform, a sound corporate strategy is required for developing internal capabilities and competencies while coping with the macro environmental conditions. In many western countries, management theories of strategy have been developed over the past four decades and applied to different industries (Rumelt *et al.*, 1994). However, efforts devoted to the unique Chinese construction context remain at an infancy stage (Cheah and Chew, 2005). The main objective of this research is to construct a conceptual model for the development of long-term strategy for large Chinese construction firms. The model should fit with the local industrial environment and aim to identify critical strategic variables and their inter-relationships that would contribute to long-term performance of a firm.

Research methodology and scope of paper

Figure 1 shows the associated components and variables of the overall conceptual model. Effectively, Figure 1 also shows the research methods adopted for the entire study. The overall methodology involves extensive literature review, environmental analysis, case studies and questionnaire survey.

The literature review stage involves a comprehensive review of journal papers, texts, proceedings, dissertations and other publications. It is divided into two parts. The first part studies the diverse theoretical schools of thought in strategy and also analyses the limitations of applying these streams directly to the context of the Chinese construction industry. Based on the review of the first part, the second consolidates selected theories towards forming a basic model that is more suitable for the context of the Chinese construction industry. Obviously, literature review is an ongoing exercise throughout the entire research due to two reasons:

- (1) the landscape of strategic theories is dynamic and ever-changing. New propositions published from time to time add new insights to refine the basic model; and
- (2) the context of Chinese construction is also ever-changing due to the fast pace of growth and economic development in the country.

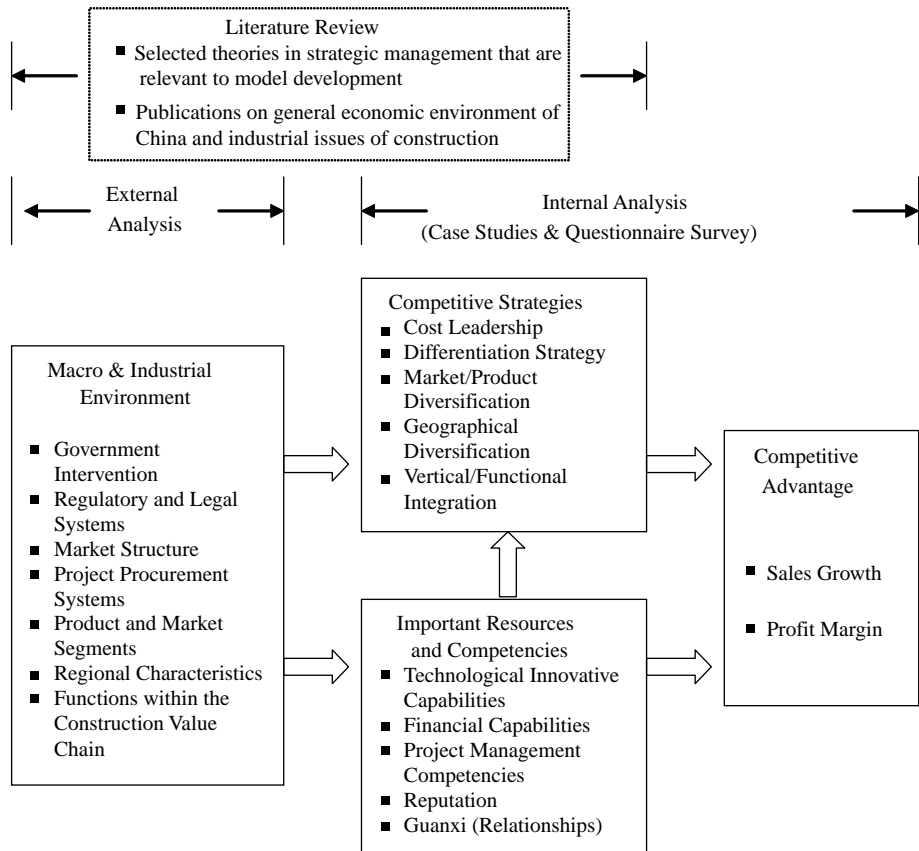


Figure 1.
Overview of conceptual
model and research
methods

The skeleton of the basic conceptual model is constructed through incremental and logical deduction from all sources gathered at any one time.

The second stage of environmental analysis examines external factors and industrial conditions that affect the general outlook of a firm. It combines both qualitative study (which builds on the earlier literature review) and quantitative analysis (which uses basic statistical tools to analyze industry information gathered from publicly available materials). The environmental analysis is suggestive of a set of competitive strategies and important resources and competencies (IRCs) that may be relevant to overcome some of the unfavourable industrial conditions.

To further examine the characteristics of these competitive strategies and IRCs, face-to-face interviews and case studies are conducted for 12 large construction firms that represent relatively successful cases in the domestic market. To reflect potential interrelationships that exist among competitive advantage, competitive strategies and IRCs, a total of eleven hypotheses is formed. These hypotheses are then tested using a set of survey questions.

The study of interrelationships among competitive strategies, IRCs and competitive advantages effectively form the internal analysis. The results for this part are

separately reported in Cheah *et al.* (2007) and further details can be found in Kang (2006). This paper focuses on issues concerning the external analysis of macro and industrial environmental conditions that govern the Chinese construction industry.

Theoretical foundations

The field of strategic management is built up by a composition of different disciplines ranging from psychology and political science to economics and finance. This heterogeneous composition effectively ensures that consensus of view could only be sought in a few broadly based directions. Some researchers in the mainstream have classified the various schools of thought based on their perceptions of the content of strategy, the process of strategy development, and the context (both corporate and environmental) that influence the two former aspects. A good overview of these various typologies is given by Elfring and Volberda (2001). The following lists some of the prominent ones that commonly appear in the literature:

- Miles and Snow's (1978) classification of firms as defenders, prospectors and analyzers;
- Rouleau and Séquin's (1995) four types of strategic discourse: classical, contingency, socio-political and socio-cognitive forms;
- Mintzberg *et al.*'s (1998) ten schools of thought which can largely be separated into two groups: prescriptive versus descriptive in character; and
- Whittington's (2001) four perspectives of strategy: classical, evolutionary, processual and systemic.

The list of typologies obviously does not end here, but a comparison of the merits and flaws of these different categories of strategic theories is beyond the scope of this paper. Within the diversity of strategic management theories, the industrial organization (IO) theory, resource-based view (RBV) and competence-based view (CBV) theories are found to be relevant in building up the competitive advantage of Chinese construction firms.

According to Kale's (1999) definition, competitive advantage refers to the ability of a firm to outperform its rivals on some performance criteria, such as profitability and market share. A major source of building competitive advantage can be traced to the IO theory. The theory proposes that the so-called "above-industry-performance" should emerge from the positioning of a company within an industry, which in turn is primarily determined by the strategy adopted by the company. It may be illustrated by a framework known as the "industry structure – firm conduct – performance" model. The term industry structure in this framework refers to the characteristics of an industry. Firm conduct refers to specific firm actions in an industry, such as strategies, research/development, and investment behaviours. Performance refers to the individual performance measure of a firm, such as profitability and sales growth. This framework implies that industry structure is the major force that determines the conduct of the firm, and this conduct will in turn determine the performance of a firm.

The "industry structure – firm conduct – performance" framework has provided a useful way of analyzing industry structure and evolution, firm behaviours and competitive interactions among firms. Other management researchers and writers who

have developed theories on this basis include Porter (1980, 1985) and Oster (1999). Porter, in particular, highlighted that the analysis of industrial structure would lead to three different generic strategies: differentiation, cost leadership, and focus.

Another theoretical source of competitive advantage comes from the RBV and CBV theories (Wernerfelt, 1984; Peteraf, 1993). These theories are based on the notion that firms are fundamentally heterogeneous in terms of their resources and competencies. Furthermore, RBV and CBV exploit the specific resources and competencies of a firm which could match the opportunities and threats in the external environment (Andrews, 1987; Barney, 1991). These resources include financial resources, tangible resources (such as plant, equipment and buildings) and intangible resources (such as patents, know-how, brands and experience) (Dunning, 1988). Competencies may also be functionally based (Snow and Hrebiniak, 1980). For example, Hitt and Ireland (1985) described that “competencies occur through development of specific activities associated with each function.” Ansoff (1986) developed a “competence grid” model in which the individual skills and resources can be organized according to major functional areas, such as marketing, research and development, operations and general management and finance. RBV and CBV theories indicate that firm’s resources and competencies are the major sources of competitive advantage if they could meet four criteria: value, rareness, non-substitutability and imperfect imitability (Barney, 1991).

In a way, it can be said that IO theory starts by looking at external factors before determining the right competitive strategies to cope with these factors. RBV and CBV, on the other hand, start with the accumulation of resources and internal development of competencies – competitive advantage arises as a natural by-product of these internal processes. Although some debates exist among IO, RBV and CBV theorists concerning the source of competitive advantage and the “correct” way of crafting strategy (Whittington, 2001), the authors do not view the two streams of theories as mutually exclusive. In fact, some of the competitive strategies, such as differentiation, require prior development of certain resources and competencies (such as technological and innovative capabilities). This logic is reflected by the direction of the arrows shown in Figure 1.

Environmental analysis

Governmental influence and regulatory factors

Like many other industries in China, the construction industry is subjected to a high degree of government intervention which results in a lot of uncertainties in its regulatory systems. Different layers of government authorities can directly affect the progress of construction works by promulgating various rules and procedures to regulate the operational environment (Zhu and Hu, 2001). These government authorities do not only function as regulators of the industry but also act as legislators. Ministry-level agencies, such as the Ministry of Construction, Ministry of Railways, Ministry of Transportation and Ministry of Electrical Power, all possess regulatory power over certain parts of the construction process that fall within their jurisdictions. Each of these ministries has its own system, and they conveniently divide construction market segments into exclusive “territories” based on their administrative power through their central and local divisions. Thus, a typical construction project may be administered and influenced by multiple authorities if it spans the boundaries of jurisdictions of these ministries.

The legal system of Chinese construction industry further introduces other uncertainties into the system. The Chinese construction industry lacks a fully developed and matured legal system. According to the Ministry of Construction's report entitled "Legislative Program of Construction Laws System" in 1991, eight construction laws, 38 construction regulations and some additional local regulations need to be developed. Until now, only the Construction Law (1997, 2004) and the Bidding and Tendering Law (1999) have been enacted (Zhu and Hu, 2001; Lam and Chen, 2004).

There also exist excessive administrative procedures. Many authorities would structure regulations according to their own benefits and interests, and exercise their legal enforcement power according to regulations set in their own regimes. Furthermore, the extent of enforcement frequently depends on the subjective opinion of individual officials (Chen, 1997, 1998; Zhu and Hu, 2001).

The complexities and uncertainties arising from issues related to government influence and regulatory factors represent a major problem in the Chinese construction industry. This would affect the behaviour of companies. The institutional Information-Space (I-Space) framework, developed by Boisot and Child (1999), may be used to determine a way to cope with these complexities and uncertainties (Figure 2).

The I-Space model classifies an institutional environment along three dimensions: codification, abstraction and diffusion. Codification involves the assignment of data to categories. A phenomenon is well codified when the basis of assignment can be performed in a clear cut manner. In contrary, an uncoded phenomenon assumes that the task has too many exceptions that prevent routine codification. For example, the legal systems of some developed countries are said to be codified because of its clear procedures of implementation. The second dimension, abstraction (which is related to codification), involves a reduction in the number of categories to which data needs to be codified. In this dimension, "abstract" means that one captures the structure that underlies a given phenomenon, while "concrete" means otherwise. The third dimension, diffusion, refers to the population of data-processing agents by which information could be diffused. Along these three dimensions, an institutional

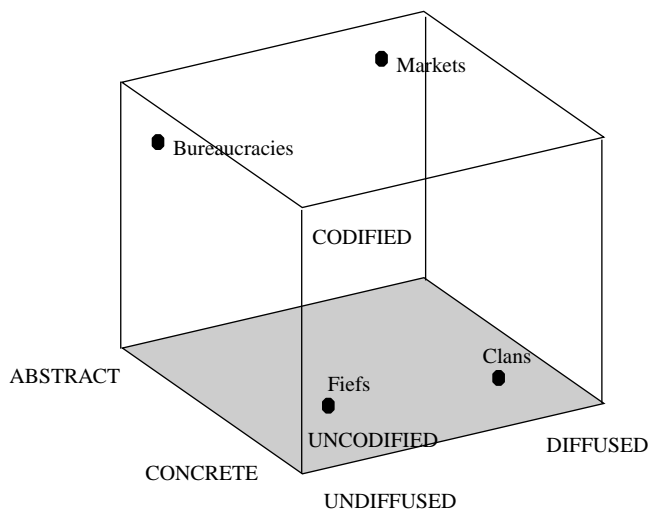


Figure 2. Information-Space framework

environment can be classified as either belonging to bureaucracies, markets, fiefs or clans, as shown in Figure 2.

Relating this I-Space model to the previous descriptions of governmental influence and regulatory factors, it is found that the Chinese construction industry fall into a regime that has the following characteristics:

- *Uncodified.* Lack of a fully developed and matured legal and regulatory system and lack of implementation and supervision.
- *Concrete.* Complex, tedious and overlapping administrative procedures and regulations.
- *Diffused.* Many authorities participate in the industry, and there are a huge number of construction companies.

Therefore, according to Figure 2, the Chinese construction industry would exhibit clan-like characteristics.

The significance of having clan-like characteristics leads to the recommendation of two approaches to handle this highly complex institutional context in China. One approach is to reduce cognitive complexity by imposing routines and standards. This approach requires the Chinese Government and legislative authorities to develop a clear and matured legal and regulatory system in order to reduce uncertainties. However, this approach progresses too slowly. Another approach is to absorb the complexity. This approach requires the companies to establish a set of enduring relationships with the different levels of governments and other participants in the industry in order to reduce the uncertainties. In the Chinese culture, setting up enduring relationships means building up *Guanxi* or relationship. This latter approach is at least within the control of the companies as compared to the first approach. Therefore, *Guanxi* is one important resource that needs to be cultivated by the Chinese construction companies to deal with the environmental factors highlighted here.

Market structure

The market structure of an industry may be studied using the concepts of concentration ratio and Lorenz Curve. Concentration ratio is a measure of intensity of competition in an industry and is usually indicated by the summation of market shares of the four largest firms. The concentration ratio of the Chinese construction industry is very low. It has been reported as 5.85, 4.97 and 5.2 percent, respectively, for 1999-2001 (Shanghai Jinxin Security Research Institute, 2002), indicating a highly fragmented industry.

The Lorenz Curve projects the degree of competition in a market by measuring the inequality in size distribution of the firms within that market (Buzzelli, 2001). When comparing the Lorenz Curve of construction firms in China, the USA and Japan, it is found that the Lorenz Curve for the case of China is closer to the diagonal line, as shown in Figure 3. This confirms that the size of construction firms in China is more evenly distributed and the market is less concentrated as compared to the situation in the two developed countries.

Both the concentration ratio and the Lorenz Curve suggest that the Chinese construction market is very competitive, and it is difficult for large companies to exert significant influence on both market and technological development in the industry. This could be attributed to several factors.

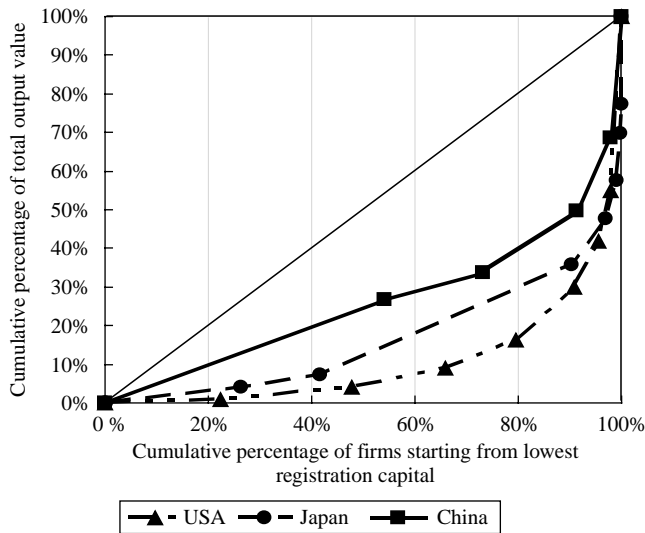


Figure 3.
Lorenz Curves of construction firms of China, the USA, and Japan

In a local construction market, the barriers to entry are low for local companies but high for competitors originating from other cities or provinces. In order to lighten the political pressure of unemployment and fiscal problems, some local government authorities allow local companies with poor technology and management skills to thrive with a low level of pricing. This results in low quality projects. On the other hand, to protect the local firms, many administrative ordinances are issued to discourage more competent competitors from other regions from entering the local market.

High exit barriers also hinder firms from leaving the industry even though they may be less competent. First, the secondary resource market in China is not very developed, so assets cannot be sold or transferred effectively in the market place when companies exit. Second, there are no comprehensive legislations that govern the procedures for bankruptcy, mergers and acquisitions. Third, in order to maintain the social order of the local community, local authorities set many hurdles to prevent the exit of companies, particularly for state-owned enterprises that carry the bulk of the social burden such as providing employment opportunities and associated welfare to the workers.

In summary, the low level of concentration ratio and low entry barrier indicate that there are too many construction firms in the industry, with none of them capturing a sizable market share and exerting significant influence on the development of the industry. Coupled with the local protectionist policies and the delayed demise of underperforming construction firms, these factors lead to an “overcrowding” effect and excessive competition in the industry. The high exit barriers further create a surplus of production capacity.

In order to cope with the unfavorable market conditions, large companies in the construction industry should provide unique products and services to the clients so as to avoid competition that is not placed on a level ground. This would require them to pursue a differentiation strategy to distinguish themselves from their competitors.

Project procurement systems

In the Chinese construction industry, there are generally three kinds of procurement systems:

- (1) opening bidding, in which the client call for tender in different public media, and any contractor may ask for the bidding documents and submit its tender for the project;
- (2) selective bidding, in which the client develops a short list of contractors whom he considers qualified to undertake the work and invites them to submit their bids; and
- (3) negotiation, usually adopted when the documentation necessary for bidding is incomplete, or when the client wants the contractor's advice on certain aspects of the project.

In opening bidding, price is often regarded as the single most important factor and many contracts are awarded on the basis of lowest tender. Therefore, many Chinese construction firms have chosen to pursue the cost leadership strategy in order to match with the nature of this bidding system. Other than price, however, quality and credibility are increasingly becoming a client's major concerns. Wang (2004) noted that a client may pre-qualify bidders by factors including their past performance, technological capability, project management competencies and reputation. The client would then invite only qualified contractors to bid and this applies to the second and third type of procurement systems. Therefore, the degree of product differentiation of construction firms has a certain impact on securing a contract, although the impact of these non-price factors on the evaluation of bids typically vary from project to project. Thus, other than the cost leadership strategy, a construction firm may also explore the differentiation strategy to cope with the procurement system. This strategy is often supported by quality improvement, reduction of project delivery time, innovation and reputation.

Market segments of the Chinese construction industry

Construction is mainly a service industry. Market segmentation in this context can be measured by how many different types of projects that a construction firm is capable of or targeting to take on. According to the Industrial Classification and Codes for National Economic Activities published by the National Bureau of Technological Supervision of China in 1994, the Chinese construction industry can be divided into three major groups:

- (1) civil engineering construction;
- (2) installation of power-lines, pipelines, and facilities; and
- (3) decoration work.

Civil engineering construction is further divided into sub-categories including: buildings; mines; railways, highways, tunnels and bridges; dams, power plants and ports; other remaining types of civil engineering construction. In 1997, building works was the largest output sector, accounting for 68.23 percent of total output value (Wang, 2004). Railways, highways, tunnels and bridges was the second largest sector, accounting for 10.93 percent of total output value.

Although as a whole the concentration ratio of the Chinese construction industry is low, some sectors may have larger ratios than the others, e.g. 9.92 percent for railways, highways, tunnels and bridges and 13.41 percent for dams, power plants and ports. This implies that within these sectors, the difference in market share between the leading companies and the average players becomes more significant. For larger firms, they could potentially pursue a market/product diversification strategy into these sectors that may provide more profitable opportunities to leading firms.

The existence of higher concentration ratios in some of these sectors is indeed not a transient phenomenon. Projects in sectors such as tunnels and dams are technically more complex and large-scale. This requires higher level of advanced technology, capital investments, project management competency, experience and strong reputation in the field. Infrastructure systems such as highway, railway and power plants are usually government owned and require a certain extent of *Guanxi* with the government in order to compete in these sectors. All these factors would create barriers to entry, preventing unqualified competitors from entering, allowing greater room for differentiation and finally resulting in higher concentration ratios.

Regional characteristics

Currently, there are 31 provincial administrative units in China. These include four municipalities (Beijing, Shanghai, Tianjin and Chongqing) which are directly administered by the central government; five autonomous districts (Inner Mongolia, Guangxi, Tibet, Ningxia and Xinjiang); and 22 ordinary provinces. From an economic perspective, these 31 provincial units can be divided into eastern coastal region, central region and western region. Companies in different regions enjoy different levels of average profit margin as verified by data published by the National Bureau of Statistics of China. If part of these differences is attributed to locational factors, a firm may want to consider diversifying into regions that may provide better prospects and profitability. When evaluating which regions to enter, however, both the level of risk and profit margin of the regions need to be considered.

Obviously, the definition of risk is very broad. Here, it is represented by the coefficient of variance (CV) of profit margin, calculated as the ratio of standard deviation to the mean of profit margin. This measure allows for the comparison of the variability in profitability across different regions as normalized by their mean values. Figure 4 shows the relationship between the average pre-tax profit margin and the CV of the different regions for the period 1997-2003. A significant negative relationship

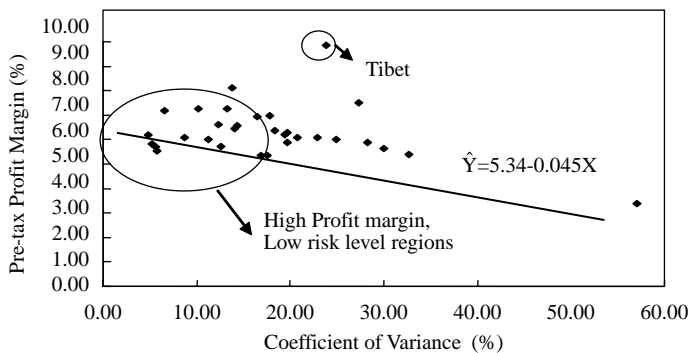


Figure 4. Relationship between pre-tax profit margin and risk level

exists between these two variables, except for Tibet, which is clearly an outlying case (when the output share of each region is studied in detail, it is found that Tibet made up only 0.12 percent of total output value – thus the influence of Tibet could be neglected). The Kolomogorov-Smirnov test further suggests that these two variables belong to a normal distribution (the results do not reject the null hypothesis at the 5 percent level). The outcome of a linear regression analysis produces a slope coefficient of -0.045 which is significant at the 1 percent level.

In corporate finance and typical asset pricing models, a positive relationship between risk and return would be expected (Brealey and Myers, 2002). Contrary to this logic, Figure 4 shows that for the Chinese construction industry, some regions could in fact enjoy a higher return while at the same time are subjected to less volatility! One possible explanation for this phenomenon is the distortions introduced by unique government policies. Those high risk-low margin provinces, such as Xinjiang, Qinghai and Jinlin, are all located in the less developed western and central regions. Until the past few years, the central government’s preferential development policy has channeled more resources and foreign direct investments to the eastern coastal region, thereby causing regional economic disparities (Wu, 2006). Local governments in the eastern coastal region also offer preferential treatment to selected local companies (particularly state-owned enterprises) (Han and Ofori, 2001). These actions essentially lower the risk of operation in the eastern region as they enjoy the development boom in their region.

However, all these are slowly changing with the government’s proclamation of developing the western and north-east regions in recent years. In 2000, the State Council issued “The Notification of the Steps of Developing the Western Regions” which is a sign of placing focus on the inner regions. Still, the disparities in risk level and profitability among different regions suggest that a geographical diversification strategy may be considered by larger Chinese construction companies. A company should try to identify and enter into regions with higher profitability level or lower variability.

Functions within the construction value chain

Figure 5 shows a typical value system of the construction industry as developed by Cheah and Chew (2005). In this subsection, the market condition of each function is first

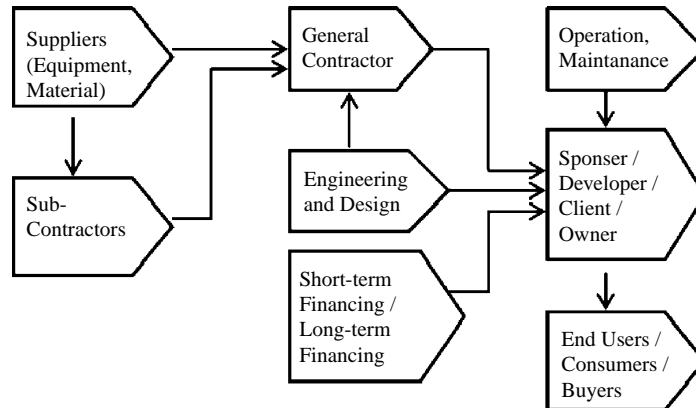


Figure 5.
Upstream and
downstream sectors of the
construction value Chain

Source: Cheah and Chew (2005)

examined before assessing whether larger firms should pursue a functional/vertical integration strategy along the value chain of construction.

Subcontractor/specialty contractor. Lan and Jackson (2002) commented that a low degree of specialization and an underdeveloped contracting system continue to exist in the Chinese construction industry. To a certain extent, the Chinese construction industry is still donning the legacy of the former centrally planned economic system. The similarity in size and services among firms results in an undesirable firm size distribution in the industry and a majority of the firms compete in the same general contracting market. Thus, many of the subcontracting and specialty works are performed in-house by the general contractors themselves. They only subcontract works or procure specialty services when they have no other alternatives (as in some projects, the client may require the services of nominated subcontractors). In China, there is less separation between subcontracting and general contracting as compared to the situation in other countries.

Engineering/design. Xu *et al.* (2004) reported that the revenue growth rate of engineering/design sector was about 20.67 percent in 1999 and the net profit growth rate was 3.97 percent. Although these growth rates are not as high as the general contracting sector (which records an average output growth rate and profit growth rate of 29.63 percent and 26.22 percent, respectively, from 1997 to 2003), many main contractors still opt to vertically integrate into this sector. This is because in design-build and engineering-procurement-construction contracts – which are getting increasingly popular – in-house design ability is a key to securing a contract.

Construction equipment/materials manufacturing. Most Chinese construction companies buy their own equipment rather than lease or rent them. It is also relatively rare for firms to vertically integrate into equipment manufacturing. As a result, construction equipment manufacturing has only a weak link to the mainstream construction industry in China (Chen, 1998). Compared to the equipment sector, it is a different situation for construction materials. In general, construction materials account for 60 percent of total construction costs. The average after-tax net profit margin of the construction materials sector was 3.2 percent in 2002 (Xiang, 2003), higher than the 1.94 percent average net profit margin of the overall construction industry. Attracted by a higher return and at the same time aiming to reduce their reliance on building material suppliers, some construction companies have chosen to backward integrate into construction materials manufacturing. Lan and Jackson (2002) reported that in Shanghai, 20 percent of ready-mixed concrete and 25 percent of plasterboard in the market are manufactured by the Shanghai Construction Group, a large general contractor.

Real estate development. The real estate sector has developed very rapidly in the past decade. In 2002, the growth rate of total revenue stood at 29.4 percent, the average pre-tax profit margin was 8.8 percent and the average net profit margin was about 3.6 percent. The corresponding figures for the construction industry for the same year were 21, 5.36 and 1.94 percent, respectively. Again, spurred by the higher growth and profit prospects, some construction firms are exploring opportunities to expand into the real estate development sector, despite the fact that property prices in some areas, such as Shanghai, have reached worrisome levels that have drawn government intervention.

Overall, the market conditions of the related sectors discussed above indicate that large companies may adopt a vertical/functional integration strategy to venture into

upstream and/or downstream sectors in the value system to increase their revenue and profitability.

Conclusion

The application of western thinking of strategic management to the context of China requires careful consideration of the country's macro environment and the industry's unique operational factors. For the Chinese construction industry, some of the more important environmental issues include: government intervention; legal and regulatory systems; market structure; project procurement systems; product and market segments; regional characteristics; and conditions of sectors within the construction value chain.

The influence of government agencies at different hierarchical levels has created unnecessary uncertainties in construction project planning and management. Even though China stands as the fourth largest economic power in the world, its legal and regulatory systems are yet to achieve the level of maturity that matches those in the more developed countries. The analysis using Boisot and Child's I-Space model suggests that *Guanxi*, a Chinese phenomenon that has been published widely, remains the most effective resource to overcome the frictions embedded in China's governmental bureaucracy and legal and regulatory systems.

The market structure of the Chinese construction industry suffers from high fragmentation and low entry barriers but high exit barriers, which are exacerbated by protectionist policies imposed by some local governments. The different project procurement systems require development of both cost and unique drivers. Otherwise, the numerous horizontal market segments related to construction, the diverse outlook associated with various regions, and the synergies offered by upstream and downstream functions of construction, collectively suggest that opportunities exist for large firms to diversify or integrate into some of these sectors. Close examination of these environmental conditions reveal that five types of competitive strategies are potentially viable: cost leadership, differentiation, market/product diversification, geographical diversification and vertical/functional integration.

These five competitive strategies need to be cultivated by developing other important resource and competencies as shown in Figure 1. Owing to limitation of space, the discussion in this paper is limited to the context of external analysis. Verification of internal relationships that exist among these research variables, and their contributions towards sales and profit growth, are reported elsewhere (Cheah *et al.*, 2007; Kang, 2006). Finally, it is acknowledged that the findings are limited by the constant evolution of the Chinese political and economic systems and the dynamism of the construction industry. Still, it is believed that the components in Figure 1 would provide a good starting point for the management of large Chinese construction firms to develop a long-term corporate strategy.

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